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Titolo	High-Performance Computing on the Intel® Xeon Phi™ : How to Fully Exploit MIC Architectures / / by Endong Wang, Qing Zhang, Bo Shen, Guangyong Zhang, Xiaowei Lu, Qing Wu, Yajuan Wang
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Descrizione fisica	1 online resource (349 p.)
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Soggetti	Microprocessors Computer mathematics Electronic circuits Software engineering Special purpose computers Processor Architectures Computational Science and Engineering Circuits and Systems Software Engineering Special Purpose and Application-Based Systems
Lingua di pubblicazione	Inglese
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Part 1: Fundamental Concepts of MIC -- 1 High-performance Computing(HPC) with MIC -- 2 MIC Hardware and Software Architecture -- 3 The First MIC Example—Computing Pi -- 4 Fundamentals of Open MP and MPI Programming -- 5 MIC Programming -- 6 Debugging and Profiling Tools for MIC -- 7 Intel MIC MKL Library -- Part 2: Performance Optimization -- 8 Performance Optimization on MIC -- 9 MIC Optimization Example: Matrix Multiplication -- Part 3: Project Development -- 10 Developing HPC Applications Based on the MIC -- 11 HPC Applications Based on MIC.
Sommario/riassunto	The aim of this book is to explain to high-performance computing (HPC) developers how to utilize the Intel® Xeon Phi™ series products

efficiently. To that end, it introduces some computing grammar, programming technology and optimization methods for using many-integrated-core (MIC) platforms, and also offers tips and tricks for actual use, based on the authors' first-hand optimization experience. The material is organized in three sections. The first section, "Basics of MIC", introduces the fundamentals of MIC architecture and programming, including the specific Intel MIC programming environment. Next, the section on "Performance Optimization" explains general MIC optimization techniques, which are then illustrated step-by-step using the classical parallel programming example of matrix multiplication. Finally, "Project development" presents a set of practical and experience-driven methods for using parallel computing in application projects, including how to determine if a serial or parallel CPU program is suitable for MIC and how to transplant a program onto MIC. This book appeals to two main audiences: First, software developers for HPC applications – it will enable them to fully exploit the MIC architecture and thus achieve the extreme performance usually required in biological genetics, medical imaging, aerospace, meteorology, and other areas of HPC. Second, students and researchers engaged in parallel and high-performance computing – it will guide them on how to push the limits of system performance for HPC applications.